CLAIMS:

1. A method of forming a stacked semiconductor device, comprising:

forming one or more layers of compliant material on at least a portion of the top surface of a substrate, said substrate having one or more interconnect structures formed thereon, said interconnect structures each having a top surface;

curing at least a portion of the semiconductor device; and

selectively removing a portion of the one or more layers of compliant material;

assembling the substrate into a stacked semiconductor device.

2. The method of claim 1, wherein at least one of the one or more layers of material comprise non-conductive compliant materials.

3. The method of claim 2, wherein one or more layers comprise polymer based layers.

4. The method of claim 3, wherein one or more layers comprise a photodefinable polymer layer.

5. The method of claim 1, wherein at least one of the one or more layers are formed by use of a deposition process.

6. The method of claim 1, wherein at least one of the one or more layers are formed by use of one or more of: spin coating, dip coating and spraying.

7. The method of claim 1, wherein said compliant material layer is formed to a thickness greater than the top surface of the one or more interconnect structures.

8. The method of claim 1, wherein said curing process comprises an oven curing process.

9. The method of claim 1, wherein the selective removing comprises one or more of: chemical mechanical polishing (CMP), reactive ion etching (REI), and grinding.

10. The method of claim 1, wherein the selective removing comprises one or more chemical etching processes.

11. The method of claim 1, wherein said compliant material layer is selectively removed such that the material is removed from the top surface of one or more interconnect structures.

12. A method of forming a stacked semiconductor device, comprising:

forming one or more layers of photodefinable material on at least a portion of the top surface of a substrate, said substrate having one or more interconnect structures formed thereon, said interconnect structures each having a top surface;

exposing at least a portion of the one or more layers to radiation; and

curing at least a portion of the one or more layers; and

selectively etching a portion of the one or more layers of compliant material.

assembling the substrate into a stacked semiconductor device.

13. The method of claim 12, wherein said forming comprises one or more deposition processes.

14. The method of claim 12, wherein said photodefinable material layer is formed to a thickness greater than the top surface of the one or more interconnect structures.

15. The method of claim 12, wherein said curing process comprises an oven curing process.

16. The method of claim 12, wherein the selective removing comprises one or more of: chemical etch, dry etch, and mechanical etch.

17. The method of claim 12, wherein said compliant material layer is selectively removed such that the material is removed from the top surface of one or more interconnect structures.

18. A stacked microelectronic device, comprising:

a first substrate of silicon, said substrate having a top surface;

a plurality of interconnect structures formed on at least a portion of the substrate;

a layer of compliant material formed on at least a portion of the top surface of the substrate of silicon;

a second substrate of silicon with a plurality of interconnect structures formed thereon, said first and second substrate interconnect structures configured such that at least a portion of the interconnect structures of said first and second substrate respectively are in physical contact.

19. The apparatus of claim 18, wherein the apparatus comprises a stacked chipset.

20. The apparatus of claim 18, wherein the first and second substrates comprise integrated circuits.

21. The apparatus of claim 18, wherein at least a portion of the interconnect structures comprise copper vias.

22. The apparatus of claim 18, wherein the complaint material substantially comprises a soft polymer.

23. The apparatus of claim 18, wherein the complaint material substantially comprises one of: polyimide, polybenzoxazole, photodefinable siloxane, novolak, or a polynorborene buffer.

24. The apparatus of claim 18, wherein the compliant material comprises photodefinable and non-photodefinable materials.